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ASSOCIATION

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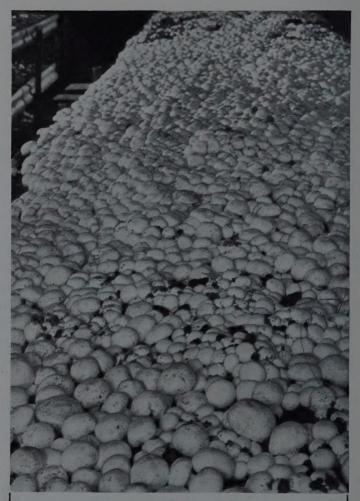
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EDITORIAL

IT MUST NOT FAIL

More perhaps than anything else, publicity has engaged the attention of the MGA over the past year and the Publicity Sub-Committee has been meeting each month to further the aims, objects and instructions which followed the 1954 Annual General Meeting.

It is inevitable that any scheme, voluntary or compulsory, will have its critics and the efforts and achievements of this small sub-committee have not escaped. There are some who have said openly that, from start to finish, it has been a failure and many more who steadfastly refuse to give credit where credit is due, denying, without reason, that any advance in either mushroom consumption or price, has anything whatever to do with the publicity so far obtained. Rather do they look elsewhere for the true cause, refusing even a crumb where a loaf of bread is due.

It is true enough that the amount raised this year for publicity has been somewhat disappointing and, to date, amounts to £1,557 1s. 10d. Taking into consideration however that this amount has been raised purely by voluntary subscription, the picture changes somewhat and the MGA has, by raising this money, set an example to the rest of the horticultural industry who talk about the crying need for publicity for their wares yet do so little to bring this about. Yes, all in all, the MGA has something to shout about.

At Reading a few days ago Mr. Eric Gardener, Chairman of the Central Horticultural Committee of the NFU said, "The sooner the horticultural industry does something about publicity the better."

Mr. Gardener was right, dead right.

Within the horticultural industry of this country mushroom growers occupy an important place, as indeed they should since they represent a £7 million industry, second only to the tomato men. But unlike the tomato, the potato, the cabbage, the apple, pear, plum and so on, mushrooms cannot easily be cultivated in the back garden and, in consequence, whilst that queen of all the horticultural world may be monarch of all she surveys, the truth is she surveys overy little. So few people really know of her delicious charms. Thus, to mushroom growers, is presented perhaps the best of all opportunities within the horticultural industry. It has something to shout about, something about which comparatively little is known. Shout about it then and let the watchword at Brighton be "It must not fail."

STANLEY MIDDLEBROOK (out of control) gives ventilation to some

PINHEADS

It isn't true. Everything is now under control—by Editor Alderton. He has had three problems:

- 1. Mushroom writers, like the horse, are slowly dying out.
- 2. A correspondent from Far Latvia who grows mushrooms in a tub threatened to get out unless I re-opened my Diary.
- 3. How could he get me back into print *unobtrusively*, and so keep his head free from the inevitable coals of fire?

The first two called for clear action—to exploit the sucker who would undergo hours of agony for a mere pittance. The solution of the third, herein accomplished, demonstrates his extraordinary understanding of the psychology of an Industry wracked by Fear, Dissension, Internal Confusion, Contention and Strife, ready for anybody's blood—including his and mine—by his choosing the moment when the F., D., I.C., C. and S. are temporarily forgotten in the National unity and excitement of the Brighton Fair. The incident, he hopes, will pass and remain unobserved. But it means two pages to him, a few shekels for me, and more pinheads in a Far Latvian tub.

Why "Pinheads"? Well, Diaries come and Diaries go, but Pinheads.....?

Some pinheads grow into buttons—ideas of promise which may or may not develop into useful information. Others grow on into perfect cups—sound common sense of great value. Some grow into "flats"—ideas that promise well but fail lamentably in later practice. And others again develop Rose Comb, Spot, clown-like bubble heads, cecid-mottled stems, curved-mirror-distortions, etc.—the superficially comic but depressingly fatuous items of so-called light relief.

But you may fumigate and tear out pinheads if you don't like them. You may tear out *these* PINHEADS.

In the past I've been accused of many things. Of being discourteous, disputatious, impetuous, turbulent, curt, intolerant, abrupt and downright impolite, and—what was that beautiful word of Mr. Duthy's?—oh, yes, polemical. But, withal, I've been honest. The sundry adjectives prove it, on the basis that a tame toleration and studied politeness are too often associated with tactful dishonesty. I've been all those things, and worse. And if you think it's all going to be different from now on, you're wrong!

1. It takes a fine, sunny, jolly summer to depress a mushroom grower. Everywhere I hear of poor crops, flies, maggots, undeveloping pinheads (how quickly my forecasts materialize!), lack of air, lack of frost to give air changes, ungovernable composts, growers down to 4 chips a week, and various other gloomy pictures, including the biggest depression of all—unusually high summer prices when you haven't anything to sell!

A small, spare-time seller of some 30 lb. a week, bought from us at a "poor man's" concession price, 'phones: "Could you let me have a special lot of 300 lb. at a specially reduced price?" I replied, "Don't you know the price has gone up to 5/-?" No, he didn't, but he concluded, "You don't mind my trying it on, do you?" He KNEW all right! My reply? "Gertcha!" (Editor's translation.)

- 2. One of the criticisms of shelves is the difficulty of getting peak heat equality in all beds. If there's a shelf grower left, here's a tip for him. Make the beds progressively deeper from top to bottom—the actual depth increase being a matter of experiment—and the benefit may be two-fold. The thicker beds may heat as well as the thinner top ones, giving presumably a better compost than the lower beds had previously, and the greater depth with more food may help to cancel out the normal yield differences between beds. Of course if all the rest of you try this with trays you are denying your persistent claim of getting something for and from nothing!
- 3. What is wrong with high pressure steam boilers for our business? I suggest high pressure salesmanship of the low pressure types. (No insult, sirs. I'm not suggesting you are low pressure types. I'm referring to the boilers you assure us are ideal for our purpose.) High pressure means somewhat drier live steam with less possible damage to compost, a stronger boiler with a longer life, easier return of condensate, etc. If the pressure is there you have it if you want it. But if you, in a misguided moment (?), buy a low pressure outfit and decide one day you want high pressure for a job—well, you jolly well can't have it. Anyway, right or wrong, we're installing one.
- 4. Grower "A" lent Grower "B" a machine as a try-out. If it worked, "B" proposed to buy one like it. But he fell upon evil times and bad fortune and the Official Receiver claimed the machine. Thus "A" finds himself in the curious position of having to buy back his own property.
- 5. In the hot weather bottom beds did better than the others. This puzzled us until we came to suppose there must have been a chimneyed movement of air along them caused by the ground vents at the house ends. A new shelf house now being built will have vents in the end windows, so arranged that they are in the same relation to the middle and top beds as the ground vents are to the bottom beds. Please don't trouble to make the obvious comments, that shelves are a decade out of date and that it will be another decade before we can test the vents. As a born pessimist I don't believe either.
- 6. We blamed the hot weather for quicker spawn runs but, now it's cooler, runs are just as fast. I suspect the makers are "speeding it up" for the benefit of their tray clientele, mistakenly supposing there is no speed limit in Tray Culture. This can be shown to be utter folly, and those who try it—whether by speeding spawn or any other way—will find they reach a point where the Tray System collapses. Further details on request.

- 7. To-day, 13th September, I have been invaded by authority—a statement pictured and proved on another page—and a most interesting discussion with Mr. Rasmussen and his Danish friends (not to mention the irrepressible Fred. C. Atkins, who knows all but seldom gives useful evidence of it), developed to the point where, as always, I was out-voted. It was unanimously agreed by the experts that negative results from experimentation are of the utmost value. For my part I'm all for positives. The ultimate of negative results is a minus at the Bank. The "authority" invasion started yesterday with a visit by a man whose name is becoming more and more a household word. but whom I dare not mention for fear of a lynching. The upshot of his visit was my discovery that I'm unintelligent and a clot; that I shall never be a mushroom grower until I pay more attention to precision and until I follow the book literally word by word. He may be right and if so does anyone want to buy an out-moded shelf farm with reasonably good profits and a bad management?
- 8. More about the maggot-ridden South. If all one hears is true our Executive Committee must be strongly criticised for expecting us to travel South to our Show for the express purpose of collecting pocketsfull and cars-full of wholly unwanted phorids. Let us have future shows on the Isle of Skye where the air is pure and no maggot lives.
- 9. I am told that if you can grow a fair crop of first quality mushrooms you would get a better total yield and therefore make more money (?) if more pinheads had grown from the same food, giving poorer quality. Morals to be drawn from this are (a) if you want to become rich grow small mushrooms, and (b) prize-winners of the best quality at Brighton are probably nearly broke and are almost certainly very poor growers. The better the quality, the "poorer" the grower, seems to be the maxim. Don't blame me—I'm not saying this. I can't grow big mushrooms (except in a heat wave, believe it or not!) but neither can I make the money that Tray men with their small mushrooms allege they can flash about. Just wait and see who stands drinks all round at Brighton; it may tell you a thing or two. The smaller the mushrooms the bigger the round?



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LANCASHIRE FARM WALK

*†Spawn Maker—amount not for publication

AREA COMMITTEE FORMED

Growers from England, Northern Ireland, Scotland and Wales gathered at the farm of Mr. F. Bleazard, at Staining, Nr. Blackpool, on Saturday, 27th August, and spent a most interesting time.

Mr. Bleazard, member of the MGA Executive Committee, farms some 30,000 sq. ft. at the Staining Nursery on the tray system and also some close to Mr. Bleazard's home at Blackpool, where he originally started growing mushrooms and has continued to do so, using former poultry houses fitted with shelves.



Mr. Bleazard, in the compost shed, telling his visitors how he does it and why.

For some time the MGA has been anxious to foster the formation of Area Committees and, for some years, one such committee has been active in the Sussex. Surrey, Kent area. At the Staining walk R. Martland Messrs. (Ormskirk), N. Olversom (Scarisbrook), T. Orritt(Burscough Bridge) R. W. Aubrey (N. Wales) and Mr. Bleazard him-

self, agreed to form a small committee for the purpose of organising further activities in the area.

About sixty people listened to Mr. Bleazard explaining the running of the Staining Farm and the poultry house units. At Staining adapted glasshouses are used, covered with fibreglass and flat asbestos sheets. There are five peak heat and spawn running rooms. Some 8,000 trays

are in use at the Staining farm. Mr. Bleazard explained that the farm was run on orthodox lines, with composting (three turns) taking 20 days from stacking to filling. About 7 lb. of sulphate of ammonia and 10 gallons of liquid blood are added per ton of manure. Peak heating is carried out dry with 4" hot water pipes from a thermostatically controlled automatic stoker-fired boiler. Heat for spawn running is similarly supplied and steam sterilized peat is used for casing.



Quite a familiar sight in large mushroom farms today—a Ferguson tractor with fork lift working in conjunction with a manure turner.

Cropping takes about 13 weeks and no tight schedule is attempted although a continuous weekly programme operates and a new pile of manure is turned nearly every Thursday. Considerable interest was displayed in Mr. Bleazard's thoroughness in treating used trays. He explained that he had been in really serious trouble from disease and

it had taken him some two years to satisfactorily clean up the trays and the premises in general. In between fillings the trays are treated no less than four times with fungicides. Mr. Bleazard holds the view that one wash cannot be more than 90% efficient, so treatment is carried out three more times.



An unusual view of Mr. Bleazard's Farm at Staining,

A discussion followed tea at the Norbreck Hydro, Blackpool, and Dr. Peet (Messrs. Geo. Monro Ltd.) gave his expert opinion on many points raised. Among other things Dr. Peet said he believed in salt and nicotine against cecid: he knew of no satisfactory reason answer to hard gilled mushrooms. Whilst one or two members claimed

to be carrying out heating after crops quite efficiently Dr. W. V. Peet said he personally preferred to soak the trays and bed boards, etc., in cresylic acid. Discussion also took place on lime and chalk, the addition of activators to compost, *Truffle* and its control.

Afterwards thanks were expressed to Mr. Bleazard, to Dr. Peet and to others who had assisted in any way.

WHAT I HAVE SEEN IN HUNGARY



Mushrooms have been grown in Hungary since the latter end of the last century. Many of the early attempts were made by gardeners who produced mushrooms in greenhouses near Budapest. The production soon proved so profitable that the gardeners went on with mushroom growing in underground lime stone caves around Budapest.

The early buildings of Budapest were largely constructed of limestone quarried from deposits surrounding the city. The earth around Budapest is like the earth around Paris—honeycombed with a system of subterranean galleries. Conditions there are very suitable for mushroom growing. By 1900 there were approximately 200,000 sq. ft. of bed space devoted to mushroom culture.

The early Budapestan mushroom beds were ridges of composted manure inside the cave, 3 feet wide at the base and about a foot and a half high.

The first spawn put on the Hungarian market was flake spawn which had been dug up from fields where mushrooms were growing wild and inoculated in ordinary beds of composted manure. When fully run, the spawned manure was crumbled into a loose mass used for spawning.

After the first world war Hungary imported pure culture mush-room spawn from Vienna and Bordeaux.

In 1926 Dr. László Makó, who practised for a long time in France, introduced pure culture mushroom spawn to Hungary. This led to further development of mushroom growing in Hungary which has now approximately 2,000,000 sq. ft. of bed area under cultivation.

The Mushroom Company in Hungary, Gombatermelési Vállalat, of Budapest XXII, Terv ut. 3, has six mushroom caves, a mushroom spawn plant and a research laboratory.

During my stay in Hungary in January, 1955, a Mushroom Research Association was founded, Agrártudományi Egyesület, Gombatermelési Munkabiozottsága, Budapest V, Reáltonada u. 13-15, the head of which is Mr. Imre Heltay, a 32-years-old scientist



Fig. 1. Bed Forming with triple mould.

who ought to be credited with the major developments of the Hungarian mushroom industry.

As previously mentioned mushrooms are grown in Hungary in caves. They are about 30-60 feet down into the earth. The galleries are 12-24 feet high and have a space of 4.000 to 10.000 sq. ft. each. There is no heat in the caves. The surrounding air temperature is about 50° F. Ventilation is effected on by vertical shafts 2 feet in diameter which are at the end of each gallery. The relative humidity is high being 80-90%. Long horse stable manure is used being both abundant and cheap. Composting takes place in the caves, which helps to warm the air to 75° F. It is done by hand, but the Company intends to mechanise this shortly.



Fig. 2. Picking.



Fig. 3. Spawn Breeding Room.

As there is no electricity in the caves a local miners' acetylene lamp is used instead.

In summer composting begins in sheds, then the partly prepared manure is carried into the caves and the operation is completed there.

In winter fresh manure when brought underground is watered. The amount of water depends on the moisture content of the manure. Two days after watering the manure is thoroughly shaken up and then built in a heap about 3-4 feet high and 20 feet wide. After 6 days when the temperature starts sinking the pile is turned for the first time and 6-6 lb. of ammonium sulphate per ton of manure

is added. There are a further two turnings at seven day intervals and water in moderation is added as and where needed. To the third turning superphosphate is added at the rate of 6-6 lb. to the ton of manure. After 28 days the compost is ready. Before filling the manure is once more shaken up, 11 lb. of gypsum per ton being added.

The beds are made by means of a treble ridge mould of sheet lined wood. The manure is stamped firmly into the mould and then emptied one after the other making rows of small ridge beds 1' 2" by 1' in triplicate.



Fig. 4. Entrance to Caves. triplicate.

Spawning takes place as soon as the bed temperature falls below 86° F. Pieces of spawn are inserted 2 in. deep into the manure. The relative humidity of the air is kept between 80%—85% at 70° F. Fifteen days after spawning the beds are cased to a depth of nearly 1 in. with a soil containing 3 parts of crumbled limestone and 1 part of sand.

Picking is done by grasping the cap of the mushroom and twisting slightly. The dirt piece of root that comes with the mushroom is not cut off with a knife as elsewhere but removed by hand and dropped into an apron which the picker wears. Each picker has two baskets: in one are dropped the closed mushrooms and in the second opened ones and those with spot blemishes.

In two years there are three crops in each gallery. Yields vary from 110—132 lb. per ton of manure.

The most common diseases are *Mycogone* and *Verticillium*: they are treated by sprinkling the beds with a 2% solution of chloride of lime. *Dactylium* so far has appeared only once. Bacterial disease is frequent in summer. Sciarids, springtails and mites are common in summer but are controlled by DDT and nicotine dusts.

When the crop is over the cave is cleaned by scraping away the top one inch. The cave is sprayed with a solution of hypochlorite of sodium and the floor flooded with a whitewash. Before composting each gallery is thoroughly sprayed with a 4% solution of formalin and closed for 48 hours.

The Company has a well-equipped spawn plant producing spawn sawn into prisms. It has about 30 strains under permanent observation and control.

There is a very modern and alive Research Laboratory. New ideas there are worked out for the faster handling of all phases of mushroom production. Cropping experiments are carried on floor beds, shelfs and trays. Temperature, humidity and ventilation in the experimental sheds are controlled. Research on casing soil has started with mixtures of ashes, peat and different organic substances. Research is also being carried out on synthetic composts. Work on pests and diseases is not forgotten.

One of the main problems of the laboratory is the study of wild mushrooms and the endeavour to bring them to fructification. The laboratory has many pure culture strains of cultivated and wild mushrooms.

*Mr. Bukowski is Director of a spawn plant in Poland. He is an Honorary member of the MGA.

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SOME EXPERIMENTS IN DENMARK*

By C. RIBER RASMUSSEN



Left to right: Messrs. Norgaard, P. Jorgensen, C. Riber Rasmussen, Stanley Middlebrook, and Fred Atkins.

The cultivation of mushrooms, and especially varieties of Psalliota bispora, plays an important role among the horticultural crops in many countries. The total production is now over 100,000 tons per year. The cultivation, which originated in France 300 years ago, seems to be one of the most difficult crops in horticulture.

In spite of comparatively extensive research and the establishment of specialised mushroom research stations in many countries, we still know only little about the behaviour of the mushroom and its mycelium and how to ensure consistently high yields. It must be noted, however, that the cropping yields the world over are steadily increasing, which no doubt is due to experimental work done.

In 1952 a mushroom research station was established in Denmark and two mushroom houses for experimental purposes, shelves and trays respectively, were erected and fitted with the necessary equipment.

In order to investigate the yielding capacity of long racing stable manure, when supplemented with certain inorganic materials, a cropping experiment repeated twice was carried out in 1953-54.

For many years it has been common practice to add 10-20 kilos (1 kilo = 2.2 lb.) of ground gypsum per ton of fresh horse manure

*Mr. Rasmussen, who is in charge of mushroom research at the Royal Veterinary and Agricultural College, Denmark, presented the above paper at the 15th International Horticultural Congress at Scheveningen, Holland, on 30th August, 1955—Editor.

before or during the composting. In many cases this appears to improve the physico-chemical properties of the compost leading to higher yields. This was first showed by **Pizer** (1), but it is still not possible to say what the main effect is. In Sweden and Denmark some growers have added pure calcium carbonate, sulphate of ammonia and superphosphate besides gypsum and found it to be of a certain value. In France and England some growers have used a few kilos of sulphate of ammonia and superphosphate per ton of fresh horse manure, but as a general rule only gypsum has been added as an inorganic supplement.

The plan for both experiments was as follows:

A: Control, no supplements.

B: 10 kilos gypsum per ton of fresh manure.

C: 20 kilos gypsum per ton of fresh manure.

D: 4 kilos sulphate of ammonia, 15 kilos pure calcium carbonate, 4 kilos superphosphate, 15 kilos gypsum per ton of fresh manure.

In case of treatments B and C, the gypsum was added at the second turning. In case of treatment D, the sulphate of ammonia was added at stacking, the calcium carbonate at the first turning, and the mixed superphosphate and gypsum at the second turning.

The composting was carried out in the open, and the horse manure (12 tons) with approximately 50 per cent. moisture was stacked in two piles of 7 meters (1 meter = 39.37 ins.) long each, 1.70 meters broad and 1.60 meters high, and with partitions between the replicated treatments. At stacking water was added to raise the moisture content to approximately 70 per cent. but leaking from the piles was avoided. Seven days after stacking the piles were turned by means of a special manure-turner and re-stacked. After four more days the manure was given its second turning and after another two days, on the 13th day after stacking, the compost was considered ready and therefore turned and on the following day filled into beds and trays. The above mentioned schedule applies to the summer experiment with warm and dry weather. In the winter experiment, however, the weather was very bad for outdoor composting with much rain, cold and windy, and this delayed the process and one more turning was necessary, bringing the total composting period up to 15 days. The temperatures in the piles varied between 62-78° C. during the composting period.

In both experiments the supplements were added according to the experimental plan. At each turning the necessary water was supplied trying to maintain a water content of 65 to 70 per cent. Each turning was carried out very carefully, and the piles were built up with vertical and compact sides and kept as loose as possible inside ensuring a sufficient penetration of oxygen in all parts of the piles leading only to aerobic fermentation and avoiding any cool and anaerobic inner zone. During the composting period ample amounts of ammonia were produced, but towards the end the smell of ammonia had decreased to such an extent as to leave only a pleasant smell and a very homogeneous chocolate

brown substance flecked with colonies of Actinomycetes—the so-called "Firefang." The D-treatment, however, had an especially sharp smell as compared with the other treatments. The moisture content and the pH of the compost was measured at filling and the results are shown in tables 1 and 2.

Throughout this article C. is used for temperature measurement. To convert C. to Fah. multiply by 9, divide by 5 and add 32.

TABLE 1

pH readings

Manure treatments

		A	В	С	D
At filling	S.	7.9	7.7	7.5	7.1
	W.	8-6	7-9	7-6	7-4
At spawning	S.	7.6	7-4	7-1	6.8
	W.	7.9	7.5	7-4	7.3

S.: Summer experiment W.: Winter experiment

TABLE 2
% moisture
Manure treatments

		Α .	В	С	D
At filling	S.	67	67	65	63
	W.	67	67	64	65
At spawning	S.	62	61	60	59
	W.	- 69	66	64	65

S.: Summer experiment W.: Winter experiment

By this time it was evident that the pH and moisture content on an average were lowest in treatment D, although considerably more water was added to this treatment than to the other ones. Temperature readings during the outdoor composting also showed a temperature of a few degrees higher in D, and all considered this treatment appeared to be superior to either A, B or C, and the supplement added seemed to activate the chemical and microbiological processes during composting. It must, however, be noted, that judging the four treatments by appearance at filling there was not much difference between them and only the pH and the moisture told the difference.

The compost was thoroughly mixed to ensure uniformity and was filled at the rate of 80 kilos of compost per square meter of bedspace, equal to 12.5 square meters per ton of fresh manure. The experiments were carried out in both types of houses with a ratio of air-space to bed-space in the growing room of approximately 1.8 cubic meters of air to 1 square meter of bed. The shelf house had six replicates (1 square meter plots) of each treatment, and the trayhouse eight replicates (½ square meter plots). In the latter case, the trays were first pasteurised or peak-heated in a special peak-heating room and at casing moved into the growing room, whereas the peak-heating and spawn-running were carried out in the shelf house itself.

The term peak-heating, which means to raise the temperature in the compost after filling to 55—62° C. by means of hot water pipes and live steam for a certain length of time, seems to be a very important process for successful mushroom growing, but unfortunately the main effect is still not fully explained. The degree of the temperature and the length of the period varies much from farm to farm. Some growers do not bring the temperature above 55° C. and maintain it for only 24 hours, and the other extreme is to keep the temperature at 62° C. for 6 to 7 days. Lambert & Ayers (3) suggest 5—6 hours at 72° C. and subsequently 3—4 days at 45° C.

The main purpose of peak-heating seems to be the following:— The compost is subjected to high temperatures under ideal conditions which lead to the optimum development of the aerobic thermophilic micro-organisms, but this only holds good if sufficient oxygen can be supplied and the compost has a sufficient water content. Besides this, the high temperature is effective in controlling certain pests and diseases.

Immediately after filling the compost into both houses peak-heating was started, and live steam produced from a transportable steam-boiler was released through perforated 1" pipes placed near the floor. After about 10 and 20 hours (summer and winter experiment respectively) the temperature in the compost had risen to 60—62° C. During the following 10—14 hours the doors and roof ventilators were opened every two hours to permit a sufficient air inlet. Soon, however, it became evident that the compost needed more air as the temperature in the beds rose 2—3° C. just after fresh air was introduced, thereby indicating that the microbiological processes were handicapped through

lack of oxygen. When this fact was realised, fresh air from the outside was introduced continuously in order to maintain 15—20% oxygen giving the microbial activity the very best conditions.

Through this sweating out process, the temperature in the compost was kept at approximately 60—62° C. By turning off the steam if the temperature rose above the desired range, or if the compost tended to be too wet, and instead using more heat from the hot water pipes, it was possible to make regulations and carry out an ideal peak-heating.

The difference in temperatures between the compost and the air was within the range of $5-8^{\circ}$ C. but decreasing throughout the period, and after about 50 and 65 hours (summer and winter respectively) the temperature differences were very slight indicating that the thermogenesis of the microflora had decreased and that it was time to terminate the process.

In both experiments much mycelium of thermophilic fungi appeared on the surface of the beds, which Lambert & Ayers (3) have determined as being a good sign. On completion of peak-heating the compost was very tender and very flecked with white colonies of actinomycetes and detected by a smell completely free from ammonia, which is very important because ammonia is very toxic to mushroom mycelium [first shown by Stoller (2)]. The compost was sampled for pH and water content, tables 1 and 2. Treschow (4) has shown that optimum pH for spawn growth lies between 6·8 and 7·0, and according to the table it is evident that treatment D in both experiments had the lowest pH, viz. 6·8 to 7·3.

The water reduction during peak-heating was very prevalent in the summer experiment, whereas there was little change in the winter. This latter is without doubt due to the fact that the weather was very cold in the winter and it was necessary therefore to use much steam resulting in less direct loss from the compost.

It must, however, be noted that there was no visible difference between the four treatments after peak-heating—only the measurements showed it. Comparing the two experiments at this stage, it was obvious that the summer experiment was in a much better condition than the winter experiment.

Just after peak-heating was finished the temperature of the compost was dropped rapidly to 30° C. and the spawn (brown strain) was planted. After spawning the temperature was kept at 20 to 24° C. until the time of casing.

The spawn-running was checked after 6 days growth and showed that the D-treatment had the very best running and with distinct graduations between D and C and between C and B whereas the running in A was very poor.

Thirteen and twenty days after spawning (summer and winter respectively) the compost was cased, and at this time the D-treatment was completely full grown, C and B almost fully grown whereas the A-treatment (control) was only partly full grown.

Three different types of soil were used for casing, namely:-

- (a) a sandy clay-soil
- (b) a crumbled meadow soil rich in humus.
- (c) a heavy clay-soil.

The pH of the soils before and after liming is shown in table 3.

TABLE 3
pH of casing soils

Type of soil	Sandy S.		Mead S.	dow W.	C Heavy Clay S. W.		
kilos pure calcium carbonate added per ton soil	10	15	15	20	20	25	
pH before liming	7.2	7.0	6.8	6.5	5.4	5.0	
pH 2 months after liming	8.0	8.1	8.0	7.9	7.3	7.1	

S.: Summer experiment W.: Winter experiment

From casing to the first fructification the temperature was dropped gradually to 16° C., and during the same period the ventilation was gradually increased. During the cropping period the air was changed by means of an electric fan from 2½ to 3 times per hour. The mushrooms from each plot were picked, counted, weighed and recorded daily. General routine work was carried out very carefully. The beds and trays were watered once a day except between the flushes where the soils were allowed to dry out to support the micro-ventilation.

Results:

Table 4 shows the cropping yields during the picking period which lasted 90 days. All figures are uncut mushrooms and kilos per square meter of bed area.

TABLE 4
Yields, kilos per square meter*

	a sandy clay				b meadow			c heavy clay				
	Sun	nmer	Winter		Summer		Winter		Summer		Winter	
	Shel- ves	Trays	Shel- ves	Trays	Shel- ves	Trays	Shel- ves	Trays	Shel- ves	Trays	Shel- ves	Trays
A. control, no supplement	14.9	16-2	13-0	11.0	17-0	17-4	12.5	10.8	16-3	16.0	12-2	10.0
B. 10 kilos gypsum per ton	17-7	15.6	14.6	13.4	18-6	18-2	14.3	12.8	16.0	16.4	15-1	13-2
C. 20 kilos gypsum per ton	17.0	16-0	13.9	13.8	18-4	16.2	13-4	14.0	15.7	16-4	14-3	14.0
D. 4 kilos sul- phate of ammonia, 15 kilos calcium carbonate, 4 kilos superphos- phate, 15 kilos gypsum per ton	21-1	18-4	16.8	16.7	24.1	20.8	18.0	16.6	21.2	19.6	17.4	18.2

*Divide by 5 to give approximate yield in lb,/sq. ft.

Summary:

The author presents the results from a cropping experiment repeated twice and carried out in the two experimental houses of the Mushroom Research Station in Copenhagen.

The main purpose was to investigate the yielding capacity of long racing stable manure pure or supplemented with the following inorganic materials:—

- A: control, no supplement to the manure.
- B: 10 kilos gypsum added per ton of fresh manure.
- C: 20 kilos gypsum added per ton of fresh manure.
- D: 4 kilos sulphate of ammonia, 15 kilos pure calcium carbonate, 4 kilos superphosphate and 15 kilos gypsum per ton of manure.

In treatments B and C the gypsum was added at the last turning. In case of treatment D the sulphate of ammonia was added at stacking, the calcium carbonate at the second turning and the mixed superphosphate and gypsum were added at the last turning.

Both experiments, carried out in a similar manner in the two houses, with trays and shelves respectively, showed clearly (1) that the supple-

ments added to the D-treatment gave a compost of a much better condition and with the lowest pH after the outdoor composting as well as after peak-heating, and (2) a much quicker spawn growth and a higher yield of as much as 42 per cent. (from 17·0—24·1 kilos per square meter in 90 picking days) as compared with control A.

The importance of using an effective peak heating (which means raising the temperature in the compost by means of live steam to approximately 60—62° C. for 50—60 hours just after filling the beds) was very evident and indicated a yield of up to 40 per cent. higher as compared with the non-treated plots.

The experiments also showed that the difference in yield between growing the crop in trays or on shelves was very small, although it is usually claimed that yields are lower from trays than from shelves. This is without doubt due to the fact that tray growers do not pay enough attention to the stacking method of the trays in the peak-heating room in respect of a sufficient supply of fresh air.

- (1) N. H. Pizer, J.Agric.Sci. p.p. 349-376, 1937.
- (2) E. B. Lambert & T. T. Ayers, Plant Disease Reporter, vo. 36, No. 7, 1952.
- (3) B. B. Stoller, Experiments in Mushroom Culture, Univ. of Wisconsin, Thesis, p.1-98, 1945.
- (4) C. Treschow, Nutrition of the Cultivated Mushroom, p. 46-56, E. Munksgaard, Copenhagen, 1944.

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About What the Other Chap Does

By R. L. EDWARDS

Ever since mushroom growers gave up devoting their lives to the preservation of imaginary secrets and formed an Association, one of their favourite pastimes has been comparing methods and results. And as, like most people, they find it difficult to obey completely the tenth Commandment, they very soon want to know how any other grower gets better results than they do. In fact when I came into the industry one of the first questions I was asked by Mr. A. was "Why does B average $2\frac{1}{2}$ lb. per sq. ft. when I can only get 2 lb.?" I have been asked similar questions ever since. No one ever has been or ever will be able to give a complete answer. One can often point out some of the differences in buildings, methods, materials or labour which contribute to such a difference in yield and that is all. But just envying B or pestering him and your mutual friends with questions is a fairly harmless pastime. The real trouble starts when you try to copy him.

The number of ways of growing mushrooms is infinite; the number of successful ways is large and has been increased in recent years by such innovations as synthetic compost, short composting, artificial casing materials, tray system, more varied spawn, new fungicides and insecticides, etc.

There are quite as many ways of courting disaster, and one of the best is to copy blindly what you think some other grower is doing, without understanding completely all that lies behind it, and all the other differences between your farm and methods, and his, which may drastically change the result if you copy him in any particular respect.

I can quote endless examples. Farm C, very successful, creosoted shelf boards after every crop, never had any Rosecomb or other trouble. Farm D started with creosoted shelf boards and very narrowly avoided disaster.

At that time creosote had been found to cause damage when used on trays, but this was believed to be due to the large amount of treated wood and the very close spacing of trays when stacked in the heat room, where the bottom of a tray is only an inch from the surface of the compost below, and often is actually touching it in places, though this should not be so. No one concerned had any idea that there was any danger in using creosote on shelves. The same grade of creosote was used as we had been using on our shelves at the Research Station, and many other growers as well. The explanation offered later was that the creosote had been applied to unseasoned wood in which the natural moisture prevented proper absorption and retention.

This shows what can happen when a well established and successful practice is copied with what appears to be a completely insignificant change—the nature of the wood.

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Grower E used a short composting method which gave consistent success for several years, after some failures in his early trials. Grower F, looking for something new to lift his yields out of the doldrums, tried to copy E, who gave him detailed instructions coupled with a strong warning, and had two failures.

In this case the most likely cause of the trouble was a failure to get enough water into the manure in the preparatory stage, before the real short composting process started. It is extremely difficult to reproduce someone else's methods merely on the basis of descriptive terms. No two people mean quite the same thing when they say "very wet," "just moist," or even "as wet as possible." The only really satisfactory way of defining such things is to have a test done, which is, of course, usually quite impracticable.

I have had endless arguments with a grower who uses a numerical scale of his own to describe for his own record purposes the wetness of his compost at filling. To use such a scale is a good idea, and he is experienced enough not to let his scale gradually slide, which is the usual weakness of scales depending on personal judgment. Our differences arise from the fact that he calls his figures "per cent. of moisture," which they are not.

It is based on the assumption that a compost which he considers perfect as to moisture content has 65% of moisture by weight. From this he estimates by inspection, feel, etc., how much above or below 65% is the moisture content of any other compost, and considers that he can do so with an accuracy of 1%. This may be so, because the appearance and feel of a compost does change considerably with quite a small change in moisture. The most serious objection to this practice is that it ignores variations which do occur in the ability of composts to absorb and hold moisture.

Two composts made under slightly different conditions can quite easily feel the same, although one contains several per cent. more water than the other. We all know this can happen with soils. The feel of a compost may actually be a better guide to the suitability of its moisture content for mushroom growing than an analytical determination of moisture content, which supports his practice of judging his composts in this way, but not the name he gives to the resulting figures!

With casing soil above all, one man's meat is another man's poison. I well remember an example of two growers exchanging soils, because one produced rather better crops than the other, and then each failing dismally with the other's soil. It must have been quite infuriating for them, and it just shows how important local conditions and management can be.

One might reasonably expect disease and pest prevention programmes to be common ground, but even here there are differences. For some reason, the two most likely are some factor in local conditions and absence of infection, some farms enjoy almost complete immunity from troubles against which others have to wage everlasting

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and intensive warfare. To quote a few examples, a well known farm enjoyed complete immunity from flies for over a year without using any insecticides at all on the beds.

The Research Station at Yaxlev never suffered from Verticillium. Mycogone, Dactylium or Truffle, although two other farms near by had some Truffle most summers, and one of them had experienced a devastating attack of Verticillium some years previously and the disease was always liable to recur if vigilance was relaxed.

Mycogone is mainly soil-borne, and if a disease free casing is used it is usually unnecessary to take further precautions. The "frightful phorid." Megaselia plurispinosa, seems to be mainly confined to the Worthing area, and growers there must take much more drastic anti-fly precautions, particularly in the summer, than are necessary elsewhere.

Some tray growers do nothing to disinfect their trays between crops, relying entirely on the peak-heat after filling to destroy any pests and disease organisms carried over. Admittedly where this policy is successful the peak-heating is thorough and well controlled, but other growers, who use a variety of fungicides and insecticides to disinfect their trays, have more trouble apparently carried over from previous crops.

Thus it is unsafe to copy another grower's hygiene programme unless you are quite sure that you have no additional risk of diseases or pests, and apart from that it may be wasteful to copy him if he has to cope with a pest or disease which never troubles you. A further point is that if he is using dangerous materials such as cyanide or DNOC he may take the necessary safety precautions as a matter of course, and it is easy for a new user to miss the essential points or omit some of them completely.

Clearly it is well worth while preparing a routine programme using standard practices and materials but tailored to suit your particular conditions and risks. At the same time it is necessary to be alert for new troubles on your own farm, and new methods on others which may

be worth using, but should not be slavishly copied.

The funny thing is that growers are always ready to copy anything which is cheaper or needs less labour, but they are not usually so keen if the cost is greater, though there are exceptions. One well known and very successful farm has a very large staff and as a result every job is done as carefully and thoroughly as is humanly possible, which I believe is an important factor in their success. I have known many people discuss and enquire about various details of their methods, with a view to copying them, but I have never yet heard of anyone deciding to start by increasing staff to enable the work to be done equally thoroughly!

FOR MEMBERS ONLY

Have you an MGA tie? Made in pure silk by A. G. Almond Ltd., the Cambridge tailors, it is green with seven MGA motifs in mushroom pink, and is obtainable from the Secretary. There is a short delay in delivery because each is hand-made. The price is 18/6d. plus postage. There will be a sample on the MGA Stand at the Brighton Exhibition on 5th October.

FRED. ATKINS ALPHABET - W. X. Y. Z

Wages. They went up 7.3 per cent. in 1952/3, according to the NFU; and they continue to rise. A £7 per week minimum is being considered this month.

Water. This is the most important single item in mushroom growing. Mushrooms are 90% water, and the present target for the moisture content of compost is 65-70%.

Watering. The application of water. At this late stage I am not to be drawn into yet another attempt to give precise advice on how much to apply!

Weed Fungi. An American term, I believe, used to classify fungous competitors of mushroom mycelium in the compost.

Wellesbourne. Those who mix BHC with their compost will be interested in the work on tainting carried out at the Wellesbourne National Vegetable Research Station. "On light and medium soils a rate of 1 oz. of 50 per cent. gamma BHC dressing (or the equivalent) per pound of seed has not been found to cause off-flavours in main crop carrots and will give a good control of the first generation of the (carrot-fly) pest "..... However, "carrots with a relatively short growing period, such as the early or late sown crops, may show considerable loss of flavour..... Dust and spray preparations containing BHC have been used on cauliflowers for the control of cabbage-root fly with outstanding success; when applied as recommended to the soil at the base of the plants, no tainting or flavour changes have resulted..... Off-flavours tend to be accentuated by canning."

Wetting Agents. These chemicals weaken the surface tension of water. Non-ionic detergents are probably more effective than anionic ones, although both are good, says MRA Report for 1946-1948, referring to the use of wetting agents to assist the wetting of straw for synthetic compost. Neither non-ionic nor anionic wetting agents had an effect on the flocculation of compost colloids by cations. Any questions?

Wheat Straw. The usual base of horse manure and synthetic composts in Great Britain. It varies enormously, depending on the strain and the land and the manuring of the land. What effect could a weed-killing hormone spray have on a subsequent mushroom compost? Conceivably, if extensively practised, such spraying could ruin the entire mushroom industry within one year.

Whey: Nitrogen escaping as ammonia from the stack during composting is wasteful and expensive. The presence of gypsum retards ammonification; Stoller contends that cheese whey (70% lactose) suppresses it more effectively. This is a problem for scientific research to decide rather than growers, I think; because if we add whey to a load of manure, and ammonification is substantially reduced, may we not finish up with an excess of nitrogen? It will depend on the amount of N present at the start—which is something we never know anyway.

White Mould. This should never have been introduced to describe Mycogone Disease. Isn't Bubble adequate?

White Plaster Mould. See Scopulariopsis fimicola.

Wood Shavings. Where wood shavings are used as bedding for horses it used to be said the manure would not make a good compost. Experience in the States and research in Germany by Dr. Rempe have proved otherwise.

Work Study. The new term for Time & Motion Study. The NAAS is taking a lively interest in it, and gave an initial demonstration in Kent at the end of June this year. Examples were given where output had been increased and costs reduced at no extra expense. It would be most interesting to have a full report of a Work Study done on a small mushroom farm, if the NAAS would undertake it; at the moment most of us are too scared at the possible expense involved.

Xylaria vaporaria. This serious "weed" competitor used to be common 20 years ago, but is now rarely seen, probably because so much more concrete is used everywhere to-day.

Year Books. We used to publish them, but the monthly Bulletin has more than taken their place. Yet I miss them.

Yield. The Wageningen Institute in Holland suggests that, to compare growing efficiencies, the best yardstick is "the yield in kilograms per square metre of bed space per year." Serious complications are the original weight of manure required to produce a kilogram of mushrooms, and the depth and density of the compost, and even were these figures also provided, I doubt if we could fairly compare the respective efficiencies of shelf and tray and glasshouse and outdoor and cave growers.

Zineb. Some formulations of zinc ethylene bis dithiocarbamate have been found to be very effective in preventing or controlling outbreaks of parasitic disease. I am a little worried that, every time I inquire, the strength and frequency of treatment appear to have been stepped up.

This "Alphabet" is being reprinted in booklet form, and will be on sale at Brighton at 5/-.

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INDIVIDUAL PUBLICITY

*Major A. L. A. DREDGE, M.B.E., TRIES IT OUT

About two months ago, the Chairman of the Sevenoaks Horticultural Society telephoned me asking for a lorry load of Mushroom Compost for his garden. He also asked if I would stage an exhibit at the Summer Show, saying that it required "fresh blood." Going on the principle of "Try anything once," I replied that I agreed and would produce growing mushrooms.

Our farm is 16,600 sq. ft. of shelves, but we were filling a house at the end of May, so we put in a tray and it was spawned on 6th June, with Mount Moist White.

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We cased it a little early and kept our fingers crossed. Then came the heat-wave; we moved it from the top of the house to the bottom. The heat persisted so we purloined all the ice from the 'frig.' and put it in a shallow container under the tray. This had the desired effect and the tray showed mushrooms in every stage on the day of the show.

In the meantime, we worked out a display on a $10' \times 3'$ table and asked the MGA if they could help us with pre-packs since we had approached three firms with no concrete results.† Eburite Corrugated Containers Ltd., came to the rescue, sent a representative from the Kent County Show at Maidstone on the previous Wednesday and dispatched a dozen pre-pack $\frac{1}{2}$ lb. printed cellophane containers which arrived on the early morning of the show.

Mr. Pearson, our foreman, and I went to inspect our site on Friday evening. We had borrowed a grass mat and were quite happy about the top of the table but the legs of the trestle table looked very bare! My wife solved the problem by loaning our green dining-room curtains!

The stand was designed for simplicity: a tray of mushrooms as the centre-piece, flanked by tomatoes and sweet peas grown on mushroom compost, two small sacks of compost, a couple of baskets of cups and opens and $\frac{1}{2}$ lb. pre-packs, which had never been shown in Sevenoaks previously.

Approximately 1,000 people visited the show and our stand created a lot of interest; some 250 "Mushrooms Month by Month" MGA Recipes and about 50 of our own Mushroom Compost Leaflets (based on the late Brigadier Nichols' Article MGA Bulletin No. 57, page 292) were distributed to the public, including many keen amateur gardeners amongst the exhibitors.

The President of the Sevenoaks Horticultural Society, Major-General The Rt. Hon. Lord Sackville, K.B.E., C.B., C.M.G., and the Chairman, Mr. J. Park, F.C.A., F.C.W.A., visited the stand at 3.30 p.m.

Lord Sackville was most interested in the tray of mushrooms and asked if we grew any other edible fungi. I explained that, as yet, there was little commercial demand in England for any types of fungi other than mushrooms. In the course of conversation, we did however discover that we had both eaten the same kind of fungus in Kashmir, where Lord Sackville had celebrated his 21st birthday, shooting ibex. (He is now 84!)

Many of the visitors wanted to buy the pre-packed mushrooms but we politely refused to sell telling them that we hoped a few would be available in the shops on the following Friday.

It remains to be seen whether the time, labour and expense involved in staging the exhibit will pay dividends, but my wife, staff and I spent a very enjoyable, if exhausting, afternoon in spite of the heat.

*Combe Bank Gardens, Sundridge, Kent.

†The MGA Publicity Committee is anxious to encourage individual publicity efforts such as this and will give financial assistance if required, so far as limited funds permit.—Ed.

THERE'S GOLD IN THEM THAR' HEAPS!

NORMAN JENKS (Pilsdon Manor Mushrooms, Dorset)

Once upon a time (to be precise it was in March of this year) there was a Mushroom Grower who, by selling his compost at prices ranging from £4.0.0. to £12.10.0 a ton, contrived to add 10.8d. per lb. to the price he received for a week's output of mushrooms. It is early to say that he lived happily ever after; but he wasn't displeased, at that.

Fairy stories have an unending fascination. But this isn't one: it's solid, sober fact. The figures are as stated.

It is the job of the writer to grip the attention of his reader from the start. If you have read the first paragraph, instead of skimming through it, your attention ought to be good and gripped by now. If it is not, perhaps a little more pressure will do the trick.

This same Mushroom Grower finds that it pays him to have a full-time salesman, on a salary plus a commission, doing nothing but selling compost. He also finds that it pays him to deliver compost from door to door within a radius of about thirty miles, using his own staff and transport. Furthermore, salary, commission, and sacking and delivery charges were all deducted before arriving at the aforesaid figure of 10-8d. per lb.

The Editor (for what he airily terms a "fee") has asked me to describe my method of marketing compost. It's a tall order, and it can't be done in a few paragraphs. I must crave your patience; and also your pardon for the inevitable use of the first person. Though the method I shall describe is my own, I do not claim that it is the best method, or the only method, or even that it is tailored to fit every individual without alteration. I do claim that it works; and I do believe that it could be made to work, with modifications, if necessary, anywhere in this country.

The three main considerations are Advertising, Delivery, and, of course, Costs. But before discussing these there is another aspect of the matter which is of such overwhelming importance that it must come first.

If compost is to be marketed successfully, a mental revolution is necessary—on the part of the Grower, himself. He sits on a gold mine; and throws away the gold as so much dross. He complains of the falling price of mushrooms; yet he virtually gives away a by-product which is so valuable that it could smooth away many a wrinkle from his furrowed brow. Why? Ask somebody else. I don't know. What I do know is that in my remote Dorset fastness when my salesman is canvassing he sometimes gets the answer: "I know your stuff is good; but it's far too expensive! Why, my cousin in Hampshire can buy it for five bob a ton!" Either my Hampshire colleague doesn't know what he has to sell, or my name is Ali Baba.

But if I'm a robber, at least I can give my victims the highest references. They come happily back for more. They tell their friends how wonderful my compost is. Bless their hearts, they even go out of their way to tell *me* how wonderful it is. They're quite right, of course. It is wonderful. They have been convinced by the results, which speak for themselves. My present task is to convince you.

The attitude of mushroom growers, or most mushroom growers at any rate, is pretty well typified by the use of the word "spent"—an abominable word, and one which I have so far avoided. The Min. of Ag. and Fish. uses it in its Bulletin No. 34, Appendix V. This Appendix is well worth study; not only for the information it contains, but even more as the most magnificent display of punch-pulling which has ever come my way. There is scarcely a statement in it which is not qualified. Never can the words "may" and "might" and "possible" have been so thickly broadcast over so small an acreage of print.

The author of the Appendix is quite right in the use of the word "spent" (although in Table 3 it is not clear whether it is the horse or the compost which is spent), because he is writing for mushroom growers, and for mushroom growers only. So far as the mushroom grower is concerned, compost, once used is indeed "spent": it will grow no more mushrooms. But as no mushroom grower who wasn't on his last three strides through the welcoming portals of the lunatic asylum would ever dream of trying to sell compost to another mushroom grower, this is of no great importance. Much more lamentable is the tendency of our Secretary and Editor to talk about "spent" compost. He is talking to growers who are selling their compost. It seems a dirty trick to lambaste a man publicly and to take his money for doing so; but lambasted he must be. The word should be expunged from our vocabulary.

The dictionary says that it means exhausted. It means more than that. It means something from which the goodness has been extracted; something which is now waste and worthless; something to be jettisoned—at a price if possible. Horse-manure is spent—for the horse; but not for the mushroom grower who queues for it. Used compost is spent—for us; but what about the gardener? What are we trying to sell? Refuse? Far from it.

I do not apologise for labouring this point. It needs more than labouring: it needs belabouring. No salesman, if he is honest, can sell a product if he has no confidence in it. To look upon compost as "spent," and try to sell it as such, is like setting up in business peddling second-hand toothbrushes—for all the price you'll get. And, from what I hear, that is the sort of price that many people are getting.

The gardener is your customer; and in this country he is as the grains of sand on the shore. Now your gardener, from the allotment-holders to the man whose garden is listed as "open to the public" by the Royal Horticultural Society (and I'm proud to say that I supply both) is an enthusiast. He is not normally frightfully concerned with theorising and analyses: he is a direct sort of chap. The question he asks is: "WILL THIS MAKE THINGS GROW?" When he finds out

by experience that the answer is YES, you have made a Happy Man. When he finds out that he is also improving his soil, you have made a friend, as well. You have also gained a customer and a free publicity agent. Gardeners talk about gardening.

I can hear the click of the magazines, as the experts load up; I can hear the whistle of the bullets. What about tainting? What about soluble salts? What about mycelium? What about cucumbers? What about copper sulphate? What about?

Where copper sulphate is concerned I am unarmoured: I have no experience of it. For the rest, I shelter behind my customers and in my own garden. I have never had a complaint from any of the buyers of the many tons I have sold. On the contrary; the praise and thanks that I get would be embarrassing, if they were not so welcome. Against tainting I use Lindane, instead of BHC. It costs me some £6.0.0. a year extra a sum which I can recover by the sale of a few bags of compost. I grow my own potatoes with lashings of compost. If there were any taint, I should be the first to know of it. I grow my cucumbers in compost without soil (there is no DDT in it); and give away the surplus by the dozen. Please believe me when I say that I am not writing all this to blow my own trumpet: the point I want to make is that our so-called "spent" compost is really nothing of the sort. It is about the best thing that a gardener can lay his hands on -as increasing numbers of them in this area are now learning. It is nothing to be ashamed of; on the contrary, we should be proud of it. Once this point is taken, the battle of selling is won.

If I have convinced you that compost is worth far more than the price you can get to have it carted away, I can go a step further. I suggested earlier on that I might be a robber: in other words, that I might be charging more for my compost than what it is worth. If you will refer to your seed catalogues and gardening papers you will see a variety of organic manures advertised at a variety of prices. It would clearly be out of place for me in this article to attempt to make comparison between the results obtained by these products and those obtained by mushroom compost; and I do not intend to do so. My own opinion is that mushroom compost is not inferior—and we'll leave it at that. But there is a very important point to be noted. Welfare State. or no Welfare State, people in these halcyon days do not work for nothing. The Distributor must take his percentage to cover his extensive advertising and administrative costs and to show him a profit; the Retailer, likewise, must eat. Both these charges are naturally reflected in the advertised selling prices.

When I first started to think of selling compost, not as something to be got rid of, but as a valuable by-product, I asked a very well-known and highly reputable firm if they would be interested in marketing it for me. They were interested; and we conferred. When I learned what percentages would be required, rightly or wrongly I decided that it would be better (besides being more fun) to try to develop the project on my own, doing my own advertising, my own selling, and my own delivery.

The next thing to do was to work out a scale of prices. I had three basic assumptions to work from:

- 1. That my Compost was as good as any advertised product.
- 2. That I should not be faced with the necessarily heavy percentages required by Distributor and Retailer.
- 3. That I should, however, be faced with my own much reduced costs for advertising, delivery, etc., over a comparatively minute area.

The results were as follows:

Per large sack (1 cwt. approx.)

			~ .			
1	sack			 	 	 12/6
2	sacks			 	 	 10/- each
- 5	sacks of	r mor	e	 	 	 9/- each

In Bulk

1 ton (in loads of not less than 3 tons) £4.0.0. per ton.

These prices include delivery to the customer's garden; there is no delivery charge. Sacks are not charged and are non-returnable.

I think that you will find these prices to compare favourably with those of nationally advertised products. At all events, apart from the occasional character who "has a cousin in Hampshire," I get no complaints. For my part, I can look my customer in the eye and feel that I have sold him a first-class article at a very fair price. And harmony reigns.

* * * *

We have now reached a stage where several decisions have been made: It has been decided to sell direct to the consumer; no outside aid is wanted, either for advertising or for delivery; prices have been fixed. What about the market?

In fact, this decision was actually taken at the very start; but, although not in order chronologically, it seemed better to bring it in at this point.

The obvious market to attack was what is loosely termed the "amateur gardener"—with the commercial grower a poor second. There were quite a few reasons for this. First of all he is more numerous. Then, by the nature of things, he tends to live in colonies, such as towns, villages, building estates, avenues, bungaloid growths, and so on: it is surprising how many gardens there are even in the middle of towns. For a salesman these concentrations make for happier hunting than bounding grasshopper-like, about the countryside seeking bulk orders from isolated commercial growers. Furthermore there is more money to be made selling compost by the sack than by the ton. Mark my words, O ye who live near the suburbs and the satellites: yours are the Elysian Fields! Selling in sacks at the prices I have given above, the minimum you can get for a ton is £9.0.0. How much did you say you were getting for yours?

Then again, the amateur gardener is an enthusiast. He is a willing buyer of anything that is good—especially if the price is right.

If I have converted you to my own faith in compost, and if you don't dispute my prices (which I don't think you will if you compare them with the ones in the gardening papers), you have the answer to the salesman's prayer: a good article, a good price, and a willing buyer.

The commercial grower is a different kettle of fish: He requires special study; and there may be space to devote to him later. For the moment let us leave him with this thought: If the mushroom grower would concentrate on the far more lucrative amateur gardener, the commercial grower who has been buying for all these years what he well knows to be excellent stuff—and buying it for a song—would feel a chilly draught. He'd be on the doorstep, clamouring. To this the answer would seem to be: clamour he never so full-throatedly, he don't get no more till he revises his ideas about prices.

* * * *

Having decided on the market, the next consideration was the plan of campaign. There seemed to be four main channels: advertising in the local Press; canvassing from door to door; a descriptive leaflet; and displays at local shows. In case what follows should strike any of you as being too parochial, I must remind you that I was asked to describe my own methods. This is quite different from producing a blueprint for others. However, as the method seems to work very well down here, and as the amateur gardener is the same enthusiastic sort of fellow, whether he is in Bridport or Beckenham, I commend it to your attention.

The first thing to do was to find a name. "Jenks's Spent Mushroom Compost" could scarcely have been bettered—to put the customer off! Even if I had a more romantic surname, it would still have been about as bad as it could be. What was wanted was a name which would excite the imagination without being misleading: a name which would promise something good—not merely a waste by-product. "Pilsdon Manor Matured Mushroom Compost" seemed to fill the bill, with a rider that wherever it appeared in print the word "Matured" should be underlined.

The slogan "Humus-Plus" was coined and wedded to the name for a very good reason. A highly knowledgeable writer in a widely-read gardening paper recently began his weekly article with the following words: "In suburban gardens, no matter where they may be, the crying need is for humus." He might have gone one better than this. He might have dropped the word "suburban"; for the truth of the matter is that most gardens suffer from the same lack. For reasons of transport, availability, expense, and many others, it is difficult for the average gardener to arrange for the supply of sufficient organic matter to keep his soil in good heart. He often has his own compost heap, which in itself is an excellent thing; BUT he is only putting back into his soil less than he took out of it. So he resorts to artificials. These undoubtedly have their value, but it is only a shot-in-the-arm value; they put no body into the soil.

Now this is where I come in. As well as giving him an article which will delight his gardener's heart with the way it makes things grow, I give him the means of improving his soil at the same time; this is stressed in the advertising matter. The compost is also delivered to his door. No fuss. No bother. He doesn't even have to write a letter. With the leaflet he gets a pre-paid postcard; all he has to do is to fill in his name and address and how many sacks he wants. When his order is delivered he gets another postcard with it. One of the greatest human frailties is putting off doing something because it means finding a piece of paper, an envelope, and a stamp. I ought to know: I am an arch-offender. So the postcards come rolling in; and the compost goes rolling out.

* * * *

The spearhead of the advertising is of course the leaflet, coupled with the visit of the salesman who delivers it. It has had a very marked success. More often than not, when the salesman calls, the gardener of the house is out winning bread; but when he returns home he will most probably read it. The results have proved to be well worth the expense. We frequently get orders from people who have had the leaflet passed on to them by somebody else.

The leaflet is intended to give the prospective customer more information about the compost than is given in the newspaper advertisements which, as you will see presently, are kept on a very different plane. It purposely avoids analyses and percentages. When an enquiry of this nature arises (and I can only remember one), the enquirer can easily be referred to the Ministry's figures.

As a copy of the leaflet itself is enclosed in this Bulletin, there is little more to be said about it. There are, however, one or two points worthy of note, and of interest to anybody who is thinking of writing his own leaflet. Experience has shown that there are two questions which keep cropping up. They will have to be dealt with in a revised edition.

One is: At what rate per square yard should the compost be used? How long is a piece of string? Some people have poor, starved, soil; some have loam like chocolate cake. It is impossible to prescribe a standard dose. My answer always is: Put on as much as you can afford. The more, the merrier. This compost is neutral: it is neither acid nor alkaline. It can do no harm; it can only do good.

The other question is: Must I store the compost under cover? This is an easy one. Madam, or Sir, the very best place to store the compost is on the beds themselves; the sooner you get it on your soil, the sooner it will start working. If you want to keep some for potting, by all means keep it out of the rain, but why not order a fresh sack?

Finally, you may wonder why the prices are not shown in the leaflet. This is simply because when the leaflet was written the prices were still experimental and might have been changed. They will be included in future editions.

The newspaper campaign was entirely different. It was never intended to convey information—the leaflet does that. It was intended

to put the name "Pilsdon Manor Matured Mushroom Compost" into the public eye with all the delicacy of a right hook—and to keep it there.

Calling all Bridport Gardeners!!

ARE YOU COMPOST MENTIS? HAVE YOU A SENSE OF HUMUS?

- Better than farmyard manure:
- Entirely free from weeds:
- Clean and odourless:
- Invaluable for the garden.

Pilsdon Manor Matured

Mushroom Compost

12/6 per sack (£1 for two) delivered to your door

Inspect a sack at E. R. GIBBS, Florist, East Street, Bridport, who will receive your orders or will ask our Sales Manager to call on you.

Nr. BRIDPORT

Thereafter, the only

difficulty was to

sustain the high

spiritual and literary level attained.

For instance:

Telephone-Broadwindsor 219

It started off with this!

Calling all Bridport Gardeners!!

You all know the story of Jack and the Beanstalk

> but what you don't know is that Jack's Mum was a Customer of ours.

Use our MATURED

Mushroom Compost

on vour own Beans and see what happens



PILSDON MANOR MISH

Telephone-Broadwindsor 219

Nr. BRIDPORT

Calling all Bridport Gardeners!!

"Fetch me the step ladder, Darling,
I want to pick some of those
dwarf Chrysanthemums

Use our MATURED

Mushroom Compost

in your garden all the year round. Spread it thickly between growing plants. The rain and the worms will combine to take its goodness down to the roots—and it will smother the weeds.

PILSDON MANOR MUSHROOMS

Nr. BRIDPOR

And again:

Telephone-Broadwindson 21

Now, whatever you may think of the type of humour, the fact is that these advertisements soon attracted a great deal of attention. People began to look first of all at their weekly *Bridport News*, as they have told me, "to see if there is a new Compost Advertisement this week." Orders began to come in. In spite of the fact that the name and address of the firm is given at the end of each advertisement, some of our less literate customers (whose ten bob notes crackle as merrily as those of a Bachelor of Arts) began to write for sacks to "The Pilsdon Manor Compost Farm," or "Messrs. Humus Plus, Ltd."

In the summer, Flower and Vegetable Shows break out like a rash. Usually they are of such a size that you could lose half a dozen of them at Chelsea; but they are not to be despised, for all that. A Show is the ideal place to exhibit compost and to take orders. The entire attendance is made up of gardeners, and keen gardeners at that. Keen gardeners are the salt of the earth—they are also bread and butter to anybody who sells compost.

The modus operandi is as follows: The Secretary will usually be glad to accept a couple of sacks to be presented as a prize. In return he will make space available, preferably at the entrance, for a small table. This is all that is needed. In front of the table there are two open sacks of compost; on the table there are the leaflets and postcards; beside the table there is the salesman, ready to chat about compost, to answer questions, and, of course, to take orders. You may be interested

in the actual results obtained at the Chard Flower Show in August. Orders taken on the spot and subsequently delivered in one load were:

						£	S.	d.
2	Sacks at 10/- each				 	 1	0	0
25	Sacks at 9/- each							
2	tons bulk at £4.0.0.	a	ton		 	 8	0	0
						_		_
						£20	5	0

Not bad for a Saturday afternoon. And this doesn't count the "invisible exports": the orders which come in later from people who took leaflets and postcards away with them.

On the other side of the ledger the figures are hardly frightening. An advertisement in the Programme for 17/6; two sacks of compost which is free to me, though you may charge it up, if you like; about sixteen miles motoring for a 10 h.p. van, and the same for the delivery lorry; sacking and delivery costs; commission at 1/- a sack and 8/- per ton bulk, £2.3.0. By the way, the selling price of this consignment works out at over £6.0.0. a ton.

Finally we come to the activities of the salesman. It goes without saying that he must have drive and enthusiasm, and that he must know his subject. Above all, he must have one job, and one job only. If you try to give him another, such as selling mushrooms, for instance, the one is done at the expense of the other, and neither gets done properly. His job here is to get the leaflet into the hands of as many prospective customers as possible. Houses are not the only places with gardens. Hotels have gardens; hospitals have gardens; towns have public gardens. Allotment Associations have Secretaries who are usually willing to distribute leaflets at Association meetings and, at the same time, to announce the special price we make for allotment-holders. (This is 8/per sack, delivered in loads of not less than forty sacks to one or, at the most, two delivery points.) Cricket Clubs have pitches which are rested in the winter; Bowling Clubs have Greens; so do Golf Clubs. There is scope here for top dressing. Time need not hang heavy on the salesman's hands.

A salesman is not doing his own job: he is doing your job for you. You are working against yourself if you do not so equip him morally and materially that he has complete confidence, not only in the quality of what he is selling, but also that you will not let him down. The first is easy. You know enough about compost now to realise that you have only to tell him the truth about it. When he leaves you after his interview his soul should be as that of a flea who has just found an untenanted dog. The world is his oyster; and you are sending him to open it with a superb product at a price which will knock spots off the ones he can see in the advertisements.

The second is easy, too. But it involves some planning, some expense, and constant supervision. The expense is well worthwhile: the compost will repay it over and over again. It is no good trying to

sell compost with the casing soil. You have promised the salesman, and therefore the customer, a quality product. Compost with casing soil is not a quality product. Therefore the casing soil must come off. This is no place to discuss the rival merits of shelf beds and trays. One man's meat is another man's poisson-boxes. I have invented a mechanical method for removing the soil from trays. It works perfectly and, believe it or not, it costs nothing. The method is available to anybody who is seriously interested in marketing his compost. For shelf beds I cannot help. It will have to be done by hand; and the cost will have to be worked out by timing the operation. Whatever the cost, it will be a fleabite to the value it will add to the compost.

The compost will have to be stored under cover. One cannot damn farmyard manure for being full of rainwater and at the same time expose one's own product to the elements. Besides, who wants to leave stuff worth up to £12.10.0 a ton out in the rain, anyhow? Storage may well be a problem and an expense, but it must be faced. It will be worth it; and the salesman will know that the compost he is selling will not vary in quality.

While on the subject of the salesman, it may be convenient to turn back to the question of the commercial grower. He is not as profitable as the amateur; on the other hand, it is comforting to have a few steady bulk orders on the books: he is excellent schooling for the salesman, and as a satisfied customer he can be good advertising. I must emphasise that in my immediate vicinity he has not been contaminated, if I may use the word, by mushroom growers who will sell him compost for next to nothing; he is, so to speak, virgin. But this does not mean that he will tumble over himself to buy my compost at £4.0.0. a ton. I have had successes and failures.

The most amusing failure was a smallish grower, not far from here. My salesman tackled him one day and reported that he was a dead loss. It so happened that a few days later I had to telephone this man about something entirely different. Out of curiosity I asked him why my salesman had failed. His reply was short and shattering. He said: "Well, if it's as good as you say it is, I don't see why you don't use it yourself."

A much more instructive, and not at all amusing, failure concerned a grower from a neighbouring county who happened to be one of the judges at a flower show where I was exhibiting compost. I got him very interested. He took the leaflet away to study; and later rang me up to ask some more questions. He was mainly concerned with tomatoes. I answered his questions and told him of the success that various customers had had with tomatoes, including the winner of the Amateur Class for tomatoes at the Melplash Agricultural Show at Bridport. He had grown his prize winning tomatoes in 'neat' compost, that is with no admixture of soil at all. (He won first prize again this year, by the way.) He seemed quite happy; and I was confident of an order. It did not arrive; so I rang him to ask if anything was wrong. After some hedging, he told me that he had been put off using my compost by the Horticultural Advisory Officer (no less) of his County Agricultural Executive Committee. There was no shaking him: the deal was off.

In no sunny mood, I telephoned this H.A.O. to ask him what the devil he meant by spoiling my business when he'd never clapped eyes on my compost or myself. Oh, he didn't think he'd done that. Oh, yes he had; and, what was more, he had advised the chap against using it particularly with tomatoes. What was wrong with it, anyway? Oh, well, you know, there are certain things in mushroom compost Such as? Well , mycelium, for instance

To cut the tale short, I asked him to come over and discuss the matter. This, apparently, he could not do, because I was not in his county. However, I went on raising such stink that in due course he did come. He then treated me to a discourse on the possible incidence of soluble salts and what might happen if this, and what could happen if that. He never mentioned his first thought on the telephone—mycelium.

In fact, he hadn't the faintest idea if my compost would be good or bad for the soil of the particular customer I was aiming at. So he played safe—at my expense.

I have set out this story in some detail, because it typifies the non-positive attitude. Meanwhile, please contrast it with this: In Bridport, there is a commercial grower who has been using my compost on his tomatoes. He also has large premises in the Home Counties. He has found it so good that he asked me if I would like him to write a testimonial about it. As this article was already on the stocks, I told him that if he really wanted to strike a blow for freedom he might write direct to the Editor of the Bulletin. He has done this, and I believe that the Editor is going to publish his letter in this issue.

[And here it is—Editor]

DEAR SIR,

I have used "Matured Mushroom Compost" supplied by Messrs. Pilsdon Manor Mushrooms for two seasons for the purpose of commercial Tomato cultivation. It has given such satisfactory results that I expressed my pleasure to Mr. Norman Jenks, of that Company.

He felt that you, Sir, might well be interested in publishing my findings in the MGA Bulletin, and at his request I gladly submit these.

The compost used was their standard product, separated from the casing soil, and I have used it both as a mulch and a base dressing.

As a Mulch

In the rainy season of 1954, a low lying Tomato house suffered severe root rot owing to a rise in the sub-soil water table. Plants showing their eighth truss ceased growing and were in imminent danger of collapse.

With a view to establishing a secondary root system a three inch mulch of Mushroom Compost was spread over the half of the house most acutely affected, and the glass heavily shaded. Within two weeks growth recommenced and the plants went on to the end of the season. They produced a satisfactory weight of fruit, most of which was free from blotchy ripening. The untreated half of the house yielded heavily blotched fruit and the plants made no further useful growth. These plants were pulled out five weeks before those in the mulched section.

The recovery of the mulched plants was so marked that we decided to use the compost as a base dressing in 1955.

As a Base Dressing

A five inch layer of compost was rotovated into the glasshouse borders, followed by a 4 ozs. per sq. yard dressing of Sulphate of Potash. As the phosphate level of the soil was known to be high, no other base fertiliser was used. Subsequent feeding throughout the season was entirely liquid.

Early growth was steady, with no sign of rankness. In spite of low night temperatures in the very cold Spring, first trusses set well. Later growth was extremely good and both weight and quality of fruit were high. 40 tons per acre was picked by 31st July.

Our soil is a medium heavy loam and the texture is greatly improved by the liberal use of the compost. The tendency to pan is greatly reduced. I might add that when mulched no weeding was necessary for the remainder of the season.

In view of this year's experience I shall certainly extend the use of this form of compost to other tomato houses next season.

WALTER A. STEED,

(Nurseryman, Isleworth, Middx. and Bothenhampton, Bridport.)

I come to my third and last example of the commercial grower, in this case it concerns a well-known Nursery. It presented a not uncommon attitude of mind and a problem in salesmanship which I completely failed to solve. No, my compost was far too expensive, though he agreed that it must be good. He could buy farmyard manure for £1.0.0. a ton which he composted with straw. Could I shake him? Not a bit. Do you compost in the open? Yes. What about leaching by the rain? Shrug. Do you use your own chaps? Yes. Do you know what they cost you per ton in labour? No. Do you get up enough heat to kill the weed seeds? Probably not. Have you ever thought how much it costs you to pull up the weeds that you have sown? No. If I supplied you with weed-free compost, you could take those men off composting and weeding and put them on to something else, couldn't you? Yes. Well, why not buy mine, then? Because it's too expensive

LUCRE—OR THE MERCENARY ASPECT

Let us take another trip into the realms of Fairyland. Once upon a time there was a Mushroom Grower who was also a Philanthropist. Chancing upon a Worthy but Impecunious Youth, he said to him: "It is more than you will need, but here is a cheque for £1,000 to set you up in business."

"Wot business?" said the W. but I.Y.

"But for the interruption," answered the M.G. severely, "I should have been telling you that by now. I shall also give you, free and for nothing, 500 tons a year of this attractive and highly-spoken-of compost. As the stuff can be sold at prices ranging from £4.0.0. to £12.10.0. a ton, it will call for no slide rule to tell you that your potential annual turnover will lie somewhere between £2,000 and £6,250. Thanks to me, your stock-in-trade costs you nothing; so, even if your expenses amounted to half these figures—which they won't—you can still make a minimum of a thousand quid a year. What you actually make will depend on your own assiduity."

"My Mum swears by Milk of Magnesia," said the W. but I.Y.

"Is that so?" replied the M.G., reaching for his wand-pocket..... Seconds later, the W. but I.Y. had been converted into a spare trolley which would be useful around the place; and the M.G. was busy planning his own sales campaign.

* * * *

How far have we departed from Real Life? Well, the Mushroom-Grower/Philanthropist is about as credible as a vegetarian tiger; and I concede that the trolley episode might be a little far-fetched. Otherwise, for all the difference there is, we might be, as we are, in A.D. 1955 with Curtains and Crises and all the other mod. incon. laid on.

Because whatever you pay for manure, whatever your operating costs may be, whatever price you get for your mushrooms, when you turn out a house the resultant compost has NOT COST YOU ONE BRASS FARTHING. You had to buy the manure to make the compost. You had to make the compost in order to grow the mushrooms. You had to grow the mushrooms, because that is your business. Suppose, for sake of argument, that when you turned the compost out it had no value whatsoever—to anybody at all. Would you stop growing mushrooms? No. The compost would become a liability; and the cost of tipping it on the nearest dump would have to be charged up to the mushroom farm.

The fact that it is of value, and of considerable value, is good fortune; but it has nothing to do with mushroom-growing for the simple reason that it will not grow mushrooms. Looked at in this way the proposition assumes an entirely different aspect. The Grower is putting himself in the same place as the Youth in our fable—before his regrettable but well-deserved transformation. He is handing himself on a plate, for nothing, his entire output of compost; and he is setting up in a second, and quite separate, business as a retailer of compost. Whether he cares to keep the two businesses together on paper, or to express his total profits from both businesses at the end of the year, or weekly, for that matter, as the profits of one business, or whether he likes to express his profits on the sale of compost in terms of extra pence per lb. on the price received for his mushrooms—a calculation which he will find illuminating—is a matter of taste. In fact, they are two separate enterprises: one is growing mushrooms, and the other is

selling compost. I know, of course, that this is a broad statement. In practice, there may well be some dove-tailing of labour and transport, for instance. In the case of a really big grower, it would probably be necessary to make the compost side an entirely separate concern, independent of the mushroom side in every way—and this for more reasons than one.

However, for the purposes of this article, may we accept the hypothesis, so far as possible, that the two enterprises are separate? It will make it easier for me to deal with costs.

I have now set up as a retailer. The commodity which I sell is "Pilsdon Manor Matured Mushroom Compost." I employ no middlemen; all costs and expenses are borne by me; and, conversely, any profits are mine. What are my prospects? Well, first of all, my supplies of compost are free. Why this should be so is neither here nor there. It is so. All I have to do is to pick it up, sack it, and sell it. If it is a bulk order, I don't need to sack it. To anybody who may quibble about the cost of separating the soil, the answer is: the chap who grows the mushrooms does that. He does it mechanically, and it costs him nothing. Furthermore, I showed him how to do it mechanically and for nothing, so he has no grumble. True, he has to get rid of the casing soil, but that's his look-out. If it weren't for me, he'd have to get rid of the compost, too. I'm really doing him a favour.

How do I stand at the outset compared with another retailer in a somewhat similar line, such as Mr. Blank, the manure-dealer who lives in the Home Counties? He supplies the mushroom outfit down here in the summer, when their supplies from local hunt stables, etc., which they collect themselves, dries up. He is prepared to send a load of manure 90 miles or more for a price which at a not uninspired guess is about four times what he paid for it. In other words, not being in business for the fun of it, he has to cover all his costs and make his profit out of 75 per cent. of his selling price. I have at least twenty-five yards in the hundred start on him. Paying nothing for my compost, I have 100 p.c. of my selling price to play with. Furthermore, I don't go 90 miles and more, or anything like it: 30 maximum would be nearer the mark. Again, although my lowest price is roughly the same as Mr. Blank's—I don't know what he charges for shorter hauls—my sack prices are considerably higher. So far, it begins to appear that, if Mr. Blank can make money, my prospects aren't too dim.

And in practice they aren't so dim, either. Let's take a look at a few figures. They are not accurate, but they won't lead you astray. They are not accurate for several reasons. One is that I am not an accountant. Another is that most of them are worked out in terms of one ton of compost, as opposed to tonnage sold in, say, a year: this is not only easier but it gives a much clearer picture. If I were an accountant, professional pride (or is it just cussedness?) would have me juggling with fractions of a penny which would only cloud the issue without making any material difference. The third and probably the most compelling reason is simply this: Some people hide their lights

under a bushel; and some don't. For my part, I am quite willing to tilt the bushel to show that there is a light, and to show that it is a powerful light; but I draw the line at lifting the whole bushel off. If anybody who is seriously interested in marketing his compost wants to know more, I should be happy to discuss the matter with him.

In the fable I said that the costs would not amount to half the figures given. They don't. You only have my word for that; but you can get a pretty shrewd idea for yourself with the aid of a watch and a pencil and paper. So as not to err on the side of optimism, however, let us assume that they are, in fact, as heavy as half. Here I must remind you again that the costs don't start until you have a heap of compost (without soil) in front of you, ready to be picked up.

What costs have to be taken into consideration in selling one ton of compost? There are only three: loading, delivery, and commission. If you want to take into account such things as salesman's salary, depreciation and maintenance, advertising, leaflets, etc., the easiest thing to do is to take them on a yearly basis and deduct them from the yearly turnover. Trying to express them in terms of one ton will give you decimal points like measles.

So, on the basis of half the selling price, the cost of selling one ton of compost in bulk is £2.0.0. This leaves £2.0.0. profit. On a basis of 500 tons a year (a figure chosen for ease of calculation), the annual profit would be £1,000 a year, less whatever deductions you have to make. This is providing that it is all sold and that *every ton is sold at bulk price*. Of course, it won't work out like this; the greater part of the compost will be sold in sacks.

Now, how much more does it cost to sell a ton of compost in sacks than it does in bulk? Delivery will be slightly more, but if loads are carefully planned to avoid unnecessary mileage, it will not be significantly different. If an awkward order is received, say, five sacks for an area where there are no other orders awaiting delivery, the salesman immediately goes off in that direction to beat up a load.

Commission goes up from 8/- to 20/- (1/- a sack) and there is the cost of sacking and of the sacks themselves. As a ton of compost in bulk weighs the same as a ton in sacks, and as these are the only additions, it would be unrealistic to maintain the fiction of "half the selling price"—especially as there are three different prices for sacked compost. With your permission, therefore, I will add these items to the figure of £2.0.0. which was assumed to be the cost for one ton bulk.

Sacks

I buy second-hand sacks from farmers by offering them a penny each more than they would get for returning them. They cost me 4d. each. (Printed paper sacks are too expensive. They are also unnecessary when dealing direct with the customer).

Sacking

Using a sackholder—which is indispensable—it does not take long to fill 20 sacks. I am going to add 5/-. Loading is already included in the £2.0.0.

Commission

8/- is already included in the £2.0.0. so I must add 12/-.

Costs for compost in sacks per ton are therefore: £2.0.0. plus 6/8 for sacks, plus 5/- for sacking, plus 12/- for commission. This comes to £3.11.8 which, again with your permission, I shall call £3.10.0. If you allow this as a reasonable figure (which it isn't, because it's too high), we can proceed to see what we stand to make per ton:—

```
At 9/- a sack .. (£9.0.0. a ton) .. £5.10.0
At 10/- a sack .. (£10.0.0. a ton) .. £6.10.0
At 12/6 a sack .. (£12.10.0. a ton) .. £9.0.0
```

Of course, these are the sort of calculations which make an accountant shudder. Well, that's justice; accountants make me shudder. too. "You can't do that," he will say. "What about varying loads at different distances. You might have to deliver, say, a dozen sacks, thirty miles away, or forty sacks, five miles. You can't just name a figure and call it 'cost of delivery per ton': you simply can't do it!" Expert and professional Sir, you are, of course, absolutely and unquestionably right. I could, if I had nothing better to do, produce graphs which would show in half-miles how much it costs to deliver anything from one to eighty sacks, anything from one to thirty miles. If I did, nobody would read them-not even you: you would want to work them out for yourself. Meanwhile, I sell compost. When I see the lorry go out, loaded with stuff which has cost me nothing, and I know that in a couple of hours or so the driver will be back with twenty or thirty quid in cheques, notes, and specie, I'm quite happy. I know that it is not costing me anything like that amount to deliver that load. even when you clap on every single expense you can think of. So I am content to guess an 'average' mileage for delivery, convert it into petrol, and call it a day. Operations, such as sacking, loading, unloading, and so on can be timed, and thus costed reasonably accurately; and the time taken to deliver and return can be 'averaged' in the same way as the mileage. But depreciation (on a second-hand lorry which does other work?), insurance, road licence ("F," or farmer's licence. Very important: saves a lot of money), stationery, stamps, advertising, telephone, etc., even salesman's salary, all worked out in terms of cost per ton at four different prices? No, Sir! That is up your street. You run along and do your sums at the end of the year, and leave me to get on with my job. (Exit discomfited accountant muttering something sounding like "taxation.")

* * * *

I was asked to describe my own method of selling compost; and I have tried to set out in some detail the basic plan, the way it is applied, and what may be expected of it. I have also managed to work in a good deal of preaching on the excellence of the compost, itself. If this were just to fill out space, it wouldn't get past the Editor. The proof, so to speak, of the padding is in the deleting. But it is not padding. Belief in the essential goodness of the compost is the driving force behind the whole thing. It's what makes the wheels go round.

It is easy enough to make a plan; but to make it work needs an unlimited supply of genuine and infectious enthusiasm; and for some reason this commodity seems to be as scarce among the mushroom fraternity, generally speaking, as compost is plentiful. Why should this be? Is it that they really don't know how good their compost is? Are they soluble-salt conscious? Has their outlook been clouded by the use of THAT WORD? Or is it that through the years it has become an unquestioned maxim that "spent" compost is unloaded on the market gardener? Whatever the reason may be, I know that I had in my office, a short while ago, the representative of a big firm. I don't know how many tons of compost they turn out a year, but it must be thousands. "We have a lot of difficulty in getting rid of it," he said. And that seems to sum up the matter.

Well, it's pitiful, isn't it? Suppose that firm produces 2,500 tons of compost a year. And suppose they were to sell it, say, half in bulk and half in sacks at 9/-. That comes to over sixteen thousand pounds. Of course, they may have so much money that it is not worth bothering about the odd halfpence!

I have, as I said, preached a lot about how good the compost is, and you may or may not believe me. But has anybody ever said that it is bad? Do the market gardeners come to ask for their money back? Nobody could call our old friend Appendix V an example of highpressure sales material; but it doesn't damn the stuff out of hand. The worst it says is that under certain circumstances, or in conjunction with certain conditions, or if certain chemicals are used with it, this, that, or the other, may happen. And the final paragraph is almost positive in its encouragement. The only qualification is about "high-lime composts." Of course, if the casing soil is removed, as it must be, there is no such thing as high-lime compost.

What we need in the mushroom world is somebody on our side: somebody with the necessary technical qualifications who would take as his basic premise that mushroom compost is first-class stuff, and set out to prove how and why it is first-class. I am not interested in what might happen under certain conditions, unless I am told how often, if ever, the conditions are likely to arise in practice, and how they can be avoided. Otherwise, when I hear about soluble salts, and suchlike, I can only reply: Well, my customers don't seem to suffer from them. And they don't. If the stuff I sell were not all that I claim for it, surely at least one of them would have been on the telephone before now to complain. But no; nary a one.

At the start of this article I said that a mental revolution was needed. That compost can be sold at the prices I have set out there is no doubt. It is being done. It must be a quality product, of course; it must be advertised; and it must be delivered. But these are the mere mechanics. The key to the whole problem lies in the mind of the mushroom-grower.

As for the market, it is on the doorstep like the morning milk. But, like the morning milk, it will stay on the doorstep until somebody brings it in.

THE LATE MR. L. F. LAMBERT

With much regret we have learnt of the death of Mr. Louis F. Lambert, the doyen of the American mushroom industry. Mr. Lambert was born in 1866, in Menin, Belgium. He emigrated with his family to St. Paul, Minnesota, in the early '90s and became interested in mushroom growing at the turn of the century. It was his principal business for 50 years, and he was among the first overseas members to join the MGA.

Mr. Lambert had several more important "firsts" to his credit. He was the first in the United States to make spawn from spores commercially, the first to sell spore culture bottle spawn (1916), and the originator of the white variety of mushrooms. He was a pioneer of synthetic-compost research in the States.

At the time of his death he was living in the town of Coatesville, Pennsylvania, where he had erected what he claimed was "the world's largest and most modern spawn plant, with subsidiary mushroom growing plant and cannery."

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YOUR SPAWN MAKERS & DISTRIBUTORS (1)

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Following a vist to Germany by Mr. R. C. Darlington of Messrs. R. C. Darlington, Ltd., Hastingwood, Harlow, Essex, to see Dr. Erwin Mantel's spawn making laboratories, Dr. Mantel himself visited this country a few weeks ago.

On his visit to Germany Mr. Darlington visited some former wine cellars at Erbach/Rhg., where Dr. Mantel grows mushrooms and carries out experiments with synthetic compost. Dr. Mantel explained that the cellars were well ventilated and suitable for cultivating mushrooms.



Dr. Erwin Mantel (left), Mr. Pernschke (centre), and Mr. R. C. Darlington.

Commenting on the cellars Mr. Darlington said he was much surprised by the layout, the extreme cleanliness and the up-to-date lighting. He was, too, particularly interested in the synthetic compost being experimented with in ridge beds.

Probably one of the most experienced mushroom growers in the world, Mr. Pernschke, of Wiesbaden, was visited by Mr. Darlington and Dr. Mantel. Mr. Pernschke, now 78 years old, was in the mushroom

industry as far back as 1911, and was in Paris with a Mr. Mouln of Montronge.

Dr. Mantel is well-known in Berlin where he worked for over ten years in the University there as an agricultural chemist. He was for some time at the Institution for Plant and Soil Biology and was later manager of the Institution for the Cultivation of Vegetables in Grossburen, near Berlin. He has been a lecturer at the University since 1949, and he is now occupied mainly with the question of mushroom cultivation and the production and manufacture of grain spawns. It was in 1937 that Dr. Mantel first began to pay particular attention to the matter of synthetic compost and he has since developed his own particular method of production.

It was in 1952 that Dr. Mantel became associated with the firm of R. C. Darlington Ltd., and it was his cultures from which the well-known "386" grain spawn was produced. In 1954, mushrooms grown from this spawn gained six awards at the Mushroom Industry Exhibition at Tunbridge Wells.

Commenting on "386" with something of a wry smile, Mr. Darlington said that like most spawn makers, he has his troubles. In 1954, he said, "we had some difficulty which involved colour but, together with Dr. Mantel, we tackled this problem and I am glad to say that we are on a tradition of modernised ideas and every possible step has been taken to see that this mishap regarding colour will not occur again."

YOUR SPAWN MAKERS & DISTRIBUTORS (2)

Mr. S. A. F. SAMPSON (Sinden Grain) of Oving, Chichester, Sussex.

One of the more recent additions to the list of spawn suppliers in this country is Mr. S. A. F. Sampson of Oving, Chichester, Sussex, who guides the distribution of Sinden Process Grain spawn, throughout the British Isles, with distinct success.

Educated at Charterhouse, he was commissioned in the Royal Navy during the Second World War. Before the war on leaving school he started work in the Insurance business and since 1939, has been an Underwriting member of Lloyds.

Immediately after the war he entered the horticultural industry with a nursery containing some two miles of cloches and electrically heated frames, producing a number of widely varying crops.

It was in a small outhouse that he started growing mushrooms and he eventually decided to concentrate on this one crop. He paid several visits to the Hauser plant in Switzerland where he met the Drs. Hausers and Dr. Sinden. Previously this plant had supplied grain spawn only to meet the demands of the unit itself but Mr. Sampson persuaded them to supply their spawn to British growers. This was early in 1952, and since then the spawn has become increasingly popular, "largely on its own merits and growers' recommendation," he said. Mr. Sampson added, "It is significant that, at that time, only one other firm was marketing grain spawn in this country but now all of them do so."



Messrs. S. A. F. Sampson (left), John Rodwell (centre), and Raymond Thompson (right).

At Chichester, Mr. Sampson now has a basic 20,000 sq. ft. producing mushrooms on the tray system. The buildings are Handcraft huts. Good quality horse manure is the compost basis and the short composting process, as described by Dr. Sinden in Mushroom Science 2, is faithfully carried out and composting completed in

seven days from the time of the first stacking. Peak heating is carried out in a well-insulated room with the temperature reaching a maximum of 140° F, with live steam. The time the compost is held at this maximum temperature is governed entirely by the condition of each individual compost when it goes in and this time may vary from the widely accepted period of 48 hours to as much as four or five days. The trays are filled and moved by roller conveyors to the spawn running room, being spawned in transit. After ten days the trays are moved by roller conveyor to the growing houses and are cased with a mixture of peat and chalk *en route*. From this point to the emptying of the house a period of ten weeks elapses which means that just over five and a half crops are taken per year.

Commenting on the short composting process Mr. Sampson says "Those who criticise short composting, as outlined by Dr. Sinden and Dr. Hauser in *Mushroom Science* 2, are not applying the instructions correctly. Once the system is mastered it becomes as simple as other composting methods." Thought provoking also is the fact that Mr. Sampson waters his crops rather heavier than the average grower.

Mr. Sampson is one of the many believers in the necessity of publicity for the industry and most effectively operates the Spawn Levy Scheme, only a very small percentage of his customers, including even those outside the MGA failing to pay the levy. He also carries out some publicity ideas of his own.

He ended up by saying "After all, Grain Spawn was invented twenty-five years ago by Dr. Sinden, and it must surely be an accepted fact now in this country that it is one of the great advances in the efficiency and economy of mushroom growing, a fact that the American growers have recognised for many years. I feel strongly that this is one of the many great developments for which the mushroom industry should be grateful to Dr. Sinden."

CAVES-FARM WALK

By kind permission of Mr. A. G. Pointing, a farm walk has been arranged for Saturday, 29th October, at the caves at Bradford-on-Avon, Wilts., where Messrs. Agaric Ltd. operate.

The walk commences at 2 p.m. and all members of the MGA are cordially invited.

In order that satisfactory arrangements can be made for tea, etc., members are asked to notify the Secretary of their intention to be present, giving the number in their party and the number of those who will be requiring tea, not later than 20th Oct. please.

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Two pictures of the outsize composting machine in use at the vast mushroom-growing undertaking of Messrs. A. G. Linfield Ltd., Thakeham, Sussex, who recently recruited a number of Maltese girls to assist with their picking. This machine, the only one of its kind, is saving labour on a large scale. Its labour saving capacity has not yet been fully assessed but it would certainly appear to do the work of ten men or more.

These pictures are reproduced by courtesy of the Editor, Worthing and West Sussex Growers' magazine.





the Mushroom





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MUSHROOM SPAWN MANUFACTURERS REQUIRE PRODUCTION MANAGER for new plant in the south of England. Must be experienced in the Manufacturing of Mushroom Spawn installations, etc. Substantial opportunity for the right person. All replies will be treated as strictly private. Salary and other pertinent information address to: R. C. Darlington Ltd., Hastingwood Laboratories, Harlow, Essex.

WANTED. Adjustable stands for 16" roller conveyors. Sampson Mushrooms Ltd., Oving, Chichester, Sussex. 'Phone Colworth 201/2.

PORTABLE BOILERS for Peak Heating and/or Soil Sterilizing, with equipment to suit users. REED BROTHERS (Engineering) LTD., Cuba Street, Millwall, London, E.14. Telephone: East 4081.

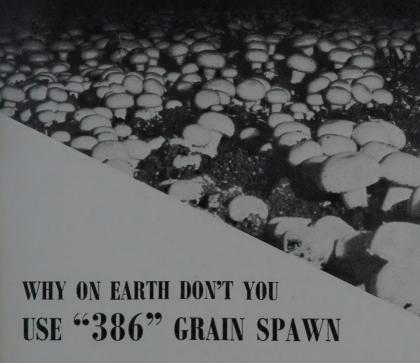
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5th & 6th OCTOBER

Lectures by WORLD FAMOUS AUTHORITIES on Mushroom Growing, Dr. J. W. SINDEN and Dr. E. HAUSER of Gossau-Zurich, Switzerland

Oct. 5th

3.45 p.m. Mrs. E. Hauser. Subject: The Economics of Mushroom Growing in the Light of Recent Developments.

Oct. 6th

 a.m. Dr. J. W. Sinden. Subject: Disease Control and Sanitation Programme for Mushroom Nurseries.

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